Citation:

Park SY, Murphy SP, Wilkens LR, Henderson BE, Kolonel LN. Fat and meat intake and prostate cancer risk: The Multiethnic Cohort Study. *Int J Cancer* 2007; 121:1339-1345.

PubMed ID: 17487838

Study Design:

Prospective cohort design

Class:

B - Click here for explanation of classification scheme.

Research Design and Implementation Rating:

POSITIVE: See Research Design and Implementation Criteria Checklist below.

Research Purpose:

The purpose of this study was to examine the association between prostate cancer risk and the intake of fat, cholesterol, meat, fish and fats from meat.

Inclusion Criteria:

Participants were included from the Multiethnic Cohort Study.

Exclusion Criteria:

Exclusion criteria included the following:

- participants self-identified as other than 1 of the 5 targeted groups (N = 5,944);
- participants had prostate cancer previously (N = 2,890);
- participants provided invalid dietary information on questionnaire (N = 3,653); or
- participants who did not provide complete information on height, weight, education level or smoking status (N = 1,988).

Description of Study Protocol:

Recruitment

Participants were recruited from the Multiethnic Cohort in Hawaii and Los Angeles in 1993-1996.

Design

Participants completed a 26-page mailed questionnaire on diet, medical history and other lifestyle exposures at baseline. After final inclusion of participants (N = 82,483), participants were identified for presence of incident cases of prostate cancer and dietary intake was obtained by a self-administered quantitative food frequency questionnaire (QFFQ) that covered the previous

year.

Statistical Analysis

Cox proportional hazards models with age was used to estimate relative risks (RR) of prostate cancer and 95% confidence intervals (CI) for foods and nutrients. Tests for interactions were based on the likelihood ratio test. *P* values reported were 2-sided, and statistical significant was set at $p < 0.05$. All analyses were conducted using SAS statistical software.

Data Collection Summary:

Timing of Measurements

Participants completed a 26-page mailed questionnaire on diet, medical history and other lifestyle exposures at baseline. After final inclusion of participants (N = 82,483), participants were identified for presence of incident cases of prostate cancer and dietary intake was obtained by a self-administered quantitative food frequency questionnaire (QFFQ) that covered the previous year.

Dependent Variables

- Incident cases of prostate cancer: identified by linkage of cohort to 3 population-based registries in Hawaii and California (statewide Hawaii Tumor Registry, Los Angeles County Cancer Surveillance Program, statewide California Cancer Registry); case ascertainment was complete through December 31, 2002.
- Dietary assessment: baseline self-administered quantitative food frequency questionnaire (QFFQ) with 180 items, with 8 frequency categories for foods and 9 for beverages, with 3 choices of portion sizes.

Description of Actual Data Sample:

Initial N: N = 82,483 (males

Attrition (final N): N = 82,483

Age: Aged 45 years or older at entry

Ethnicity: Not described

Other relevant demographics: Not described

Anthropometrics: Not described

Location: Multisite (Hawaii and Los Angeles)

Summary of Results:

Key Findings

- There were 4,404 cases of incident prostate cancer found during follow-up.

- The proportion of African Americans among cases (26.9%) was more than twice as high as high as in noncases (12.2%).
- Overweight and obesity were similar between participants in the cohort and for cases.
- A higher proportion of cases (10.1%) than the cohort as a whole (6.8%) had a family history of prostate cancer.
- None of the nutrients investigated exhibited a significant dose-response relation with prostate cancer risk.
- The relative risks for omega-3 fatty acid intake, overall and as alpha-linoleic acid (ALA), showed a suggested protective effect that was limited to moderate intake and somewhat stronger for advanced cancer.
- Total fat and saturated fat from meat were also examined, and no significant associations were found.
- There was a statistically significant inverse association for omega-3 fatty acids (p for trend = 0.04) and ALA (p for trend = 0.03) in Latinos and the suggestion of one for ALA in Whites ($p = 0.06$).

Author Conclusion:

The authors concluded that intake of different types of fat and meat showed no strong association with overall prostate cancer risk. No evidence was found that an association of fat and meat with risk of nonlocalized or high-grade prostate cancer. The authors also state that little evidence of any relation of fat and meat intake with prostate cancer risk within any of the racial/ethnic groups. An inverse association was found for omega-3 fatty acid intake, particularly for Latinos.

Reviewer Comments:

Research Design and Implementation Criteria Checklist: Primary Research

Relevance Questions		
1.	Would implementing the studied intervention or procedure (if found successful) result in improved outcomes for the patients/clients/population group? (Not Applicable for some epidemiological studies)	Yes
2.	Did the authors study an outcome (dependent variable) or topic that the patients/clients/population group would care about?	Yes
3.	Is the focus of the intervention or procedure (independent variable) or topic of study a common issue of concern to nutrition or dietetics practice?	Yes
4.	Is the intervention or procedure feasible? (NA for some epidemiological studies)	Yes

Validity Questions		
1.	**Was the research question clearly stated?**	Yes

1.1.	Was (were) the specific intervention(s) or procedure(s) [independent variable(s)] identified?	Yes
1.2.	Was (were) the outcome(s) [dependent variable(s)] clearly indicated?	Yes
1.3.	Were the target population and setting specified?	Yes
2.	**Was the selection of study subjects/patients free from bias?**	Yes
2.1.	Were inclusion/exclusion criteria specified (e.g., risk, point in disease progression, diagnostic or prognosis criteria), and with sufficient detail and without omitting criteria critical to the study?	Yes
2.2.	Were criteria applied equally to all study groups?	Yes
2.3.	Were health, demographics, and other characteristics of subjects described?	Yes
2.4.	Were the subjects/patients a representative sample of the relevant population?	Yes
3.	**Were study groups comparable?**	Yes
3.1.	Was the method of assigning subjects/patients to groups described and unbiased? (Method of randomization identified if RCT)	N/A
3.2.	Were distribution of disease status, prognostic factors, and other factors (e.g., demographics) similar across study groups at baseline?	Yes
3.3.	Were concurrent controls used? (Concurrent preferred over historical controls.)	N/A
3.4.	If cohort study or cross-sectional study, were groups comparable on important confounding factors and/or were preexisting differences accounted for by using appropriate adjustments in statistical analysis?	Yes
3.5.	If case control or cross-sectional study, were potential confounding factors comparable for cases and controls? (If case series or trial with subjects serving as own control, this criterion is not applicable. Criterion may not be applicable in some cross-sectional studies.)	N/A
3.6.	If diagnostic test, was there an independent blind comparison with an appropriate reference standard (e.g., "gold standard")?	N/A
4.	**Was method of handling withdrawals described?**	Yes
4.1.	Were follow-up methods described and the same for all groups?	Yes
4.2.	Was the number, characteristics of withdrawals (i.e., dropouts, lost to follow up, attrition rate) and/or response rate (cross-sectional studies) described for each group? (Follow up goal for a strong study is 80%.)	Yes

4.3.	Were all enrolled subjects/patients (in the original sample) accounted for?	Yes
4.4.	Were reasons for withdrawals similar across groups?	Yes
4.5.	If diagnostic test, was decision to perform reference test not dependent on results of test under study?	Yes
5.	**Was blinding used to prevent introduction of bias?**	No
5.1.	In intervention study, were subjects, clinicians/practitioners, and investigators blinded to treatment group, as appropriate?	N/A
5.2.	Were data collectors blinded for outcomes assessment? (If outcome is measured using an objective test, such as a lab value, this criterion is assumed to be met.)	N/A
5.3.	In cohort study or cross-sectional study, were measurements of outcomes and risk factors blinded?	No
5.4.	In case control study, was case definition explicit and case ascertainment not influenced by exposure status?	N/A
5.5.	In diagnostic study, were test results blinded to patient history and other test results?	N/A
6.	**Were intervention/therapeutic regimens/exposure factor or procedure and any comparison(s) described in detail? Were interveningfactors described?**	Yes
6.1.	In RCT or other intervention trial, were protocols described for all regimens studied?	N/A
6.2.	In observational study, were interventions, study settings, and clinicians/provider described?	Yes
6.3.	Was the intensity and duration of the intervention or exposure factor sufficient to produce a meaningful effect?	Yes
6.4.	Was the amount of exposure and, if relevant, subject/patient compliance measured?	Yes
6.5.	Were co-interventions (e.g., ancillary treatments, other therapies) described?	Yes
6.6.	Were extra or unplanned treatments described?	No
6.7.	Was the information for 6.4, 6.5, and 6.6 assessed the same way for all groups?	Yes
6.8.	In diagnostic study, were details of test administration and replication sufficient?	N/A
7.	**Were outcomes clearly defined and the measurements valid and reliable?**	Yes
7.1.	Were primary and secondary endpoints described and relevant to the question?	Yes
7.2.	Were nutrition measures appropriate to question and outcomes of concern?	Yes

7.3.	Was the period of follow-up long enough for important outcome(s) to occur?	Yes
7.4.	Were the observations and measurements based on standard, valid, and reliable data collection instruments/tests/procedures?	Yes
7.5.	Was the measurement of effect at an appropriate level of precision?	Yes
7.6.	Were other factors accounted for (measured) that could affect outcomes?	Yes
7.7.	Were the measurements conducted consistently across groups?	Yes
8.	**Was the statistical analysis appropriate for the study design and type of outcome indicators?**	Yes
8.1.	Were statistical analyses adequately described and the results reported appropriately?	Yes
8.2.	Were correct statistical tests used and assumptions of test not violated?	Yes
8.3.	Were statistics reported with levels of significance and/or confidence intervals?	Yes
8.4.	Was "intent to treat" analysis of outcomes done (and as appropriate, was there an analysis of outcomes for those maximally exposed or a dose-response analysis)?	Yes
8.5.	Were adequate adjustments made for effects of confounding factors that might have affected the outcomes (e.g., multivariate analyses)?	Yes
8.6.	Was clinical significance as well as statistical significance reported?	Yes
8.7.	If negative findings, was a power calculation reported to address type 2 error?	Yes
9.	**Are conclusions supported by results with biases and limitations taken into consideration?**	Yes
9.1.	Is there a discussion of findings?	Yes
9.2.	Are biases and study limitations identified and discussed?	Yes
10.	**Is bias due to study's funding or sponsorship unlikely?**	Yes
10.1.	Were sources of funding and investigators' affiliations described?	Yes
10.2.	Was the study free from apparent conflict of interest?	Yes